could some new variant on this gene that causes brain gyri cause people to be smarter?
“Evolutionary expansion of the human neocortex reflects increased amplification of basal progenitors in the subventricular zone, producing more neurons during fetal corticogenesis. In this work, we analyze the transcriptomes of distinct progenitor subpopulations isolated by a cell polarity-based approach from developing mouse and human neocortex. We identify 56 genes preferentially expressed in human apical and basal radial glia that lack mouse orthologs. Among these, ARHGAP11B has the highest degree of radial glia-specific expression. ARHGAP11B arose from partial duplication of ARHGAP11A (which encodes a Rho guanosine triphosphatase-activating protein) on

the human lineage after separation from the chimpanzee lineage. Expression of ARHGAP11B in embryonic mouse neocortex promotes basal progenitor generation and self-renewal and can increase cortical plate area and induce gyrification. Hence, ARHGAP11B may have contributed to evolutionary expansion of human neocortex.” https://pubmed.ncbi.nlm.nih.gov/25721503/

quora AI, “sample their (another person’s AI based feed) style” brings you other’s feeds, describe in “advice to Quora” quora question

there is a thing on quora about the Thinking about the use of permanently implanted electrodes to communicate with neurons, Julijan Vršnik on Quora mentioned 100

nanometer glass micropipettes as a form factor, it could be possible to draw out optical fiber that is 100 nm diameter or less, then send light through it, vaporizing the interior material away to make a 100 nm or littler hollow tube, then the tube would be filled with a conductor to make a neural electrical stimulator smaller than a 100 nm patch clamp cyte-study nanopipette, another way to do it is to have the core of the drawn fiber be a material that goes from a solid to gaseous form, sublimes, then the core would simply evaporate out. before being filled with conductor. I am an enthusiastic supporter of brain computer interfaces.

longecity bpap: Dr. Milgram and colleagues were the first who repeated our survival study with

deprenyl. They clearly intended to hold tightly to the parameters we used in our first study, and started experiments with two year old rats and treated them with 0.25 milligrams per kilogram of deprenyl. They changed, however, an important parameter. They worked with the short-lived Fischer 344 strain of rats, thus, they started treatment too late and found only a sixteen percent marginally significant prolongation of life span. Nevertheless, they found a convincingly significant increase in the longer survival.

Dr. Kitani and colleagues, who conducted the second control survival study with deprenyl, also used Fischer 344 rats. They obviously considered that these rats are shorter living than the Wistar-Logan rats, and they started to work with one and a half

year old rats. This was an advantageous change in the experimental conditions and found a satisfyingly significant, thirty-four percent prolongation of the average life span.

However, in the hope to increase the effectiveness of their treatment they doubled the dose of deprenyl. Although a higher dose is usually more effective than a lower one, the doubling of the dose was in this special case an unfavorable change. We know now that 0.01 milligrams per kilogram of deprenyl is sufficient to exert an enhancer effect. Thus the 0.5 milligrams per kilogram dose was obviously enormously high, and this explains why Kitani and colleagues found no sign of the significant extension in the longest survival which appeared in our studies and in

the Milgram et al. study.
filled fiber optics

a start on Intelligence raising genetics, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2664745/
These studies suggest that **NR2B or related downstream signalling molecules** could be promising targets for the development of cognitive enhancement strategies

A cognitive enhancer of only **positive reinforcement (good things are good and beneficial to learn about and remember)**:Studies in Aplysia and *Drosophila melanogaster* suggest that synaptic growth and plasticity involves the downregulation of cell adhesion molecules (CAMs)122-124. For example, the *Aplysia* cell adhesion molecule (apCAM) is internalized in

response to LTF-induction in sensory neurons and blocking this internalization impairs LTF and synaptic growth[124,125]. This internalization is thought to relieve the CAM-dependent structural constraints during synaptic remodeling that are required for long-term plasticity and memory.

Ablation of the CAM telencephalin (TLCN, also known as intercellular adhesion molecule 5) enhanced LTP and performance in some learning tasks, especially when a positive reward was involved, such as radial maze and water-finding tasks[126], but not others such as the Morris water maze or fear conditioning tasks, suggesting that the effect of this mutation is task-specific. Pre-pulse inhibition, a measure of sensorimotor gating which involves many brain regions including prefrontal cortex,

hippocampus, amygdala and nucleus accumbens, was found to be enhanced in TLCN-knockout mice[126]

H-ras

Although the memory enhancement studies reviewed so far were focused on postsynaptic signalling mechanisms, there is emerging evidence for a role of presynaptic signalling[133,134] in mammalian plasticity and learning. Studies of mice expressing a constitutively active form of the proto-oncogene H-ras (H-ras^{G12V}) in axons of pyramidal neurons of the postnatal hippocampus, revealed a role for presynaptic Ras/MAPK signalling in LTP and L&M[135]. Confocal and electron microscopy analysis demonstrated predominant expression of H-ras in presynaptic

axon terminals, suggesting that the Ras family of signalling molecules might have a role in presynaptic function. Although a postsynaptic role had also been reported previously, it remains to be demonstrated whether this has functional implications for L&M136. H-ras^{G12V} presynaptic expression resulted in increases in the activation of MAPK and in the phosphorylation of its substrate, synapsin I. In agreement with a role for synapsin I phosphorylation in vesicle docking and neurotransmitter release, **LTP in the hippocampal CA1 region was enhanced in these mutants, and behavioural studies demonstrated dramatic hippocampal-dependent learning enhancements.** Importantly, a synapsin I mutation, which alone had no measurable effect in LTP and learning, reversed the physiological

and behavioural enhancements of the H-ras^{G12V} mice, indicating that H-ras^{G12V}-dependent phosphorylation of synapsin I has a key role in the learning enhancements of these mutants. These results provided strong evidence that the learning enhancements described were caused by presynaptic mechanisms involving Ras/MAPK upregulation and subsequent phosphorylation of synapsin I at its MAPK site. Extensive studies in *Aplysia*[137,138] have provided compelling evidence for a role for presynaptic signalling mechanisms in synaptic plasticity and learning, and the H-ras^{G12V} studies indicated that presynaptic signalling also has a crucial role in plasticity and learning in mammals.

Cbl

Cbl belongs to another family of proto-

oncogenes that are ubiquitin ligases and function as negative regulators of activated tyrosine-kinase-coupled receptors in the immune system139. Cbl-b is highly expressed in the brain including hippocampus140 and **mice lacking cbl-b140 showed specific enhancements in remote memory: spatial learning and 1-day memory were normal, but memory tested at 45 days was considerably more robust in the mutants**. Although little is known about the role of cbl-b in the brain, it is possible that this proto-oncogene controls plasticity processes in the neocortex that are required for remote memory141,142.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2802213/ **a different paper**, First, *H-ras*^{G12V} mice searched significantly closer to the target

platform location than WT mice (*H-ras*^{G12V}, 45.1 ± 3.3 cm; WT, 56.3 ± 3.2 cm; $F_{(1,23)} = 6.0$; $p < 0.05$). Second, the number of crossings through the target platform location was significantly higher in *H-ras*^{G12V} (3.0 ± 0.7 crosses) than WT mice (1.2 ± 0.4 crosses) ($F_{(1,23)} = 4.7$; $p < 0.05$). **So the mice learned a task earlier, and as much as three times faster than regular non-*H-ras*^{G12V} mice**

article:**The molecular and cellular biology of enhanced cognition**

Yong-Seok Lee and Alcino J. Silva

Mouse models showing enhancement of learning and memory

Gene	Tg/KO	Strain	Behavioural phenotypes					Plasticity phenotypes		Comments	Refs
			wm	cxt	cue	ext	obj	LTP	LTD		
NMDA receptor-related signalling											
NR2B	Tg	B6/	↑	↑	↑	↑	↑	↑	—	NA	9

		CBF1									
Cdk5	C-KO	NA	↑	↑	—	↑	ND	↑	ND	Only reverse water maze enhanced	38
p25	C-Tg	C57Bl/6J	↑	↑	—	ND	ND	↑	ND	Only transient expression enhances memory	41
KIF17	Tg	BDF	↑	ND	ND	ND	ND	ND	ND	Working memory is also enhanced	29
$Ca_v\beta3$	KO	B6/129	ND	↑	—	ND	↑	↑	—	NA	26
Calcium homeostasis-related signalling											
RyR3	KO	C57Bl/6J	↑	ND	ND	ND	ND	↑	↓	But also see 50	189
Ncx2	KO	B6/129	↑	↑	—	ND	↑	↑	↓	NA	53
Kinase and phosphatase											
Calcineurin	C-I	C57Bl/6J	↑	ND	↑	↓	↑	↑	—	But also see 75	72, 73
PP1	C-I	C57Bl/6J	↑	ND	ND	ND	↑	↑	↓	NA	64, 190
AC1	Tg	C57Bl/6	ND	—	—	↓	↑	↑	ND	NA	80
Ap oa_1	Tg	C57Bl/6J	ND	↑	ND	ND	↑	↑	ND	NA	82
CaMKIV	Tg	C57Bl/6N	ND	↑	ND	ND	ND	↑	ND	Also see 93	94
RNA and protein synthesis											
eIF2α	Tg	C57Bl/6J	↑	↑	↑	ND	ND	↑	ND	NA	104
GCN2	KO	129SvEv	↑	↓	—	ND	ND	↑	—	Learning and LTP	103

									are impaired with strong training	
ATF4, C/EBP	C-I	C57Bl/6	↑	ND	ND	ND	ND	↑	↓	Learning is enhanced after only weak training	99
Proto-oncogenes										
H-ras	Tg	B6/129	↑	↑	ND	ND	ND	↑	ND	NA	

GABA, γ-aminobutyric acid; C-I, conditional inhibition; C-KO, conditional knockout; C-Tg, conditional transgenic; cue, cued fear conditioning; cxt, context fear conditioning; ext, fear extinction; KO, knockout; LTD, long-term depression; LTP, long-term potentiation; NA, not applicable; ND, not determined; NMDA, N-methyl-D-aspartate; obj, object recognition task; Tg, transgenic; wm, water maze; —, no change.